PML CORE RESEARCH STATUS

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AUTO-ID CENTER

OVERVIEW

- Objectives of the Physical Markup Language (PML)
- PML in relation to other Auto-ID infrastructure
- PML Core use cases and XML instances

OBJECTIVE OF THE PML

- Provide a common standardized vocabulary to distribute and represent information related to Auto-ID enabled objects

PML OVERVIEW

PML Core

Used to describe data directly generated by the Auto-ID infrastructure e.g.:

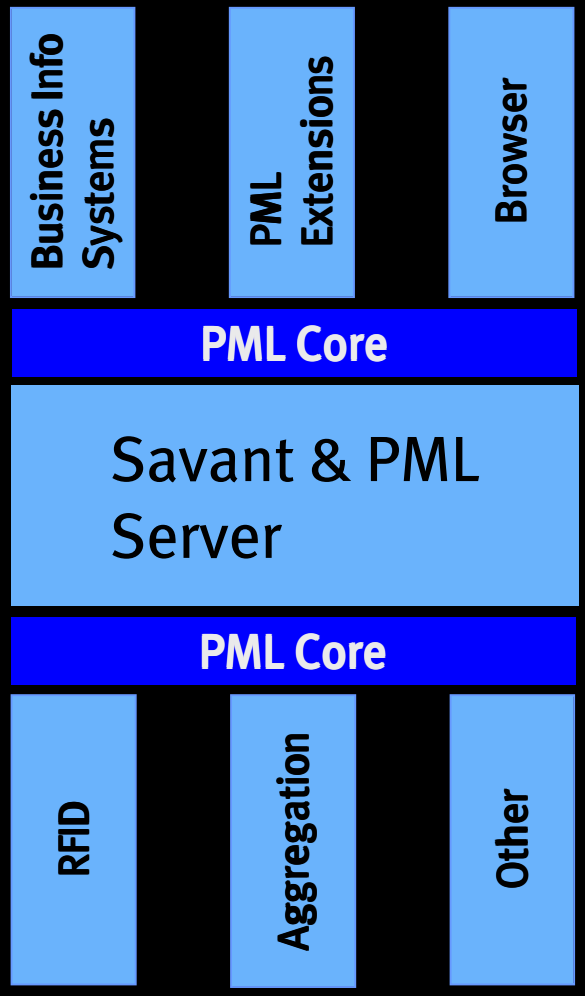
- RFID readers
- “Aggregation“ sensors
- Temperature sensors

PML Extensions

Used to provide data describing Auto-ID enabled objects e.g.:

- Product related information
- Process related information

AUTO-ID ARCHITECTURE



Location-aware applications

Location sensors

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OVERVIEW

- Objectives of the Physical Markup Language (PML)
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PML CORE SENSOR INTERFACE

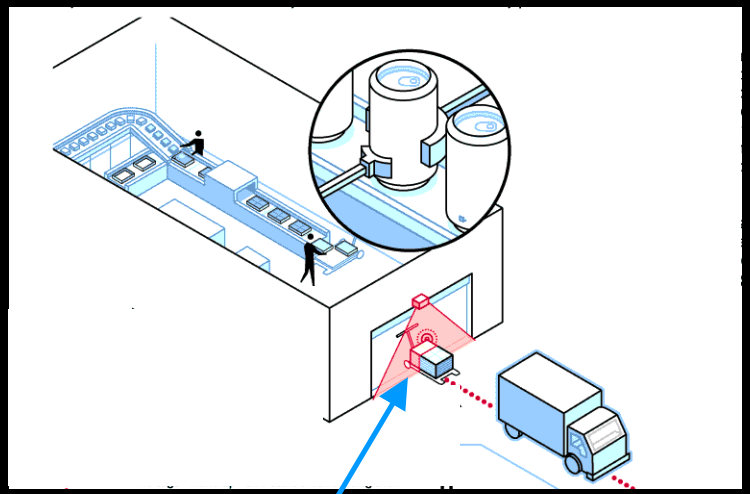
- Use case: Transfer data from the sensors to the Savant hierarchy & PML Server

- Currently there are two types of sensors being considered:

  Automatic identification sensors

  Aggregation sensors

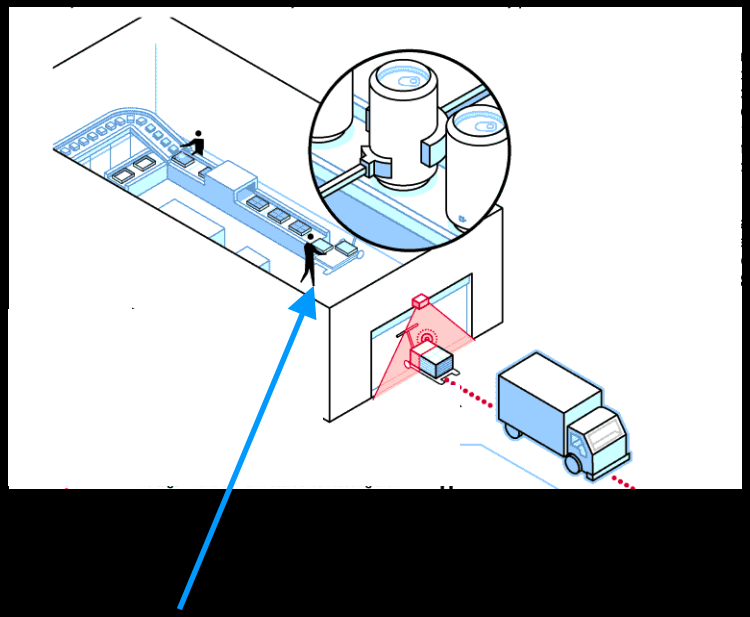
PML CORE AUTO-ID SENSOR INTERFACE



- Feed Savant & PML Server with data
- Abstract from individual automatic identification technology

```
<AutoIdEvent>
   <EventId>AAAABBBBCCCCDDDD0000111120021106130434</EventId>
   <SensorId>AAAABBBBCCCCDDDD00001111</SensorId>
   <TagId>000011112222333344445555</TagId>
   <TagId>000011112222333344445554</TagId>
   <Timestamp>2002-11-06T13:04:34-06:00</Timestamp>
</AutoIdEvent>
```

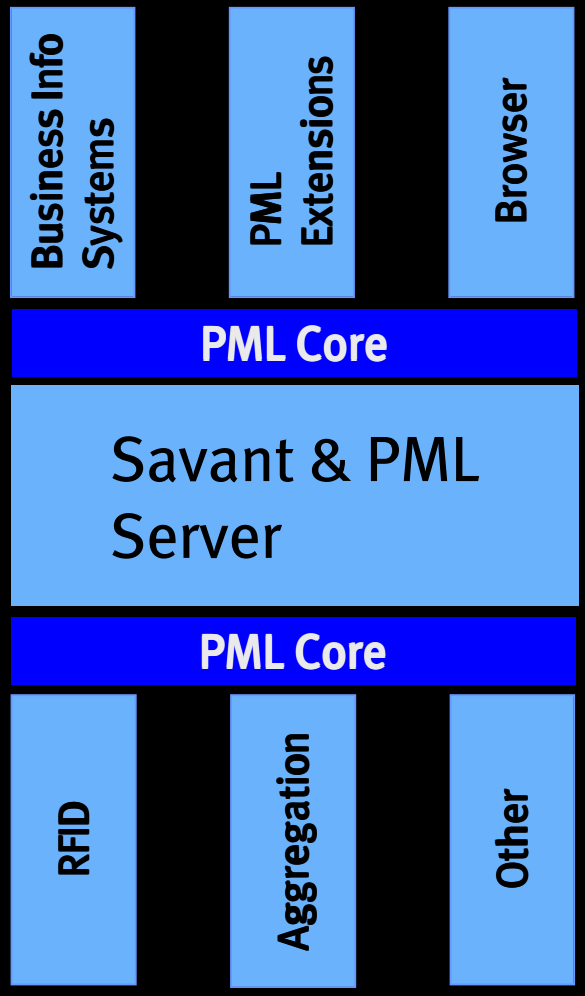
PML CORE AGGREGATION SENSOR INTERFACE



- Feed Savant & PML Server with data
- Allow Savant & PML server to „fuse“ aggregation data with data from other sensors e.g. Auto-ID sensors

```
<AggregationEvent>
   <EventId>00001111222233334444555520021106130434</EventId>
   <ParentId>000011112222333344445555</ParentId>
   <ChildId>AAAABBBBCCCCDDDD77771111</ChildId>
   <ChildId>AAAABBBBCCCCDDDD77772222</ChildId>
   <ChildId>AAAABBBBCCCCDDDD77773333</ChildId>
   <Timestamp>2002-11-06T13:04:34-06:00</Timestamp>
</AggregationEvent>
```

AUTO-ID ARCHITECTURE



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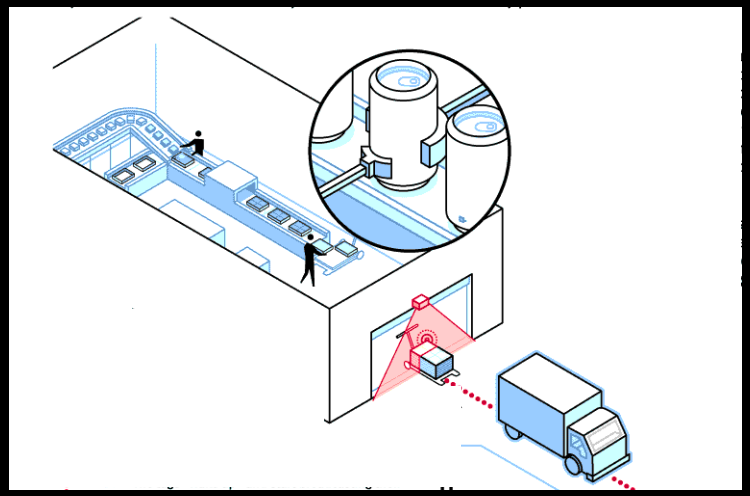
AUTO-ID CENTER

PML CORE APPLICATION INTERFACE

- Two main use cases:
  - Object tracking – where has the object been?
  - Location monitoring – what has been here?
- Abstracts from underlying sensor technology
- Introduces the concept of a located-object, which refers to all real-world entities that can be tracked.
- Each located-object can represent a location itself (e.g. a pallet)
- Uses a hierarchical location model in which location domains are ordered by a “contain“ relationship

OBJECT TRACKING USE CASE



- Same scenario as before for Auto-Id sensor interface:

  Pallet loaded with case moving through dock door

- Considering the communication between Savant&PML server and the location-aware application

OBJECT TRACKING XML INSTANCE

```
<ObjectAppearanceEvent>
  <LocatedObject>
    <Identifier IdentificationSchemeName="EPC" IdentificationSchemeAgencyName="AUTOID">
      AAAABBBBCCCCDDDD00001111</Identifier>
    <AlternativeIdentifier IdentificationSchemeName="AB12" IdentificationSchemeAgencyName="Company A">
      98765</AlternativeIdentifier>
    <Description>Pallet</Description>
  </LocatedObject>
  <Location>
    <Symbolic>
      <Identifier IdentificationSchemeName="GLN" IdentificationSchemeAgencyName="UCC">
       0061000009899 </Identifier>
      <Area>Dock Door</Area>
      <Position>Wal-Mart/Bentonville DC/Dock Door15</Position>
    </Symbolic>
  </Location>
  <Timestamp>2002-11-23T14:34:45-06:00</Timestamp>
  <Confidence>SENSED</Confidence>
</ObjectAppearanceEvent>
```

PML CORE SCHEMAS

- Based on XML Schema release of the W3C
- Uses XML Schema features to enforce datatypes and structure
- Developed following the guidelines of ebXML Core Component Specification (CCTS Version 1.8)

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CONCLUSIONS

- Finished a first internal version of the PML Core XML schemas featuring the sensor and application interface
- Next steps
  - Review and test current version of PML Core
  - Integrate into Phase 3 of the field trial
  - Integrate telemetry features
- Thanks to SUN‘s and the UCC‘s XML team for their feedback

QUESTIONS?